

CLAIMS

1. A coating film forming method for forming a coating film on a surface of a substrate on which patterns of grooves or ridges are formed, by dispensing a coating liquid from a liquid coating nozzle, said method comprising:

a step of horizontally holding the substrate by a substrate holding member;

a step of orienting the substrate in an orientation such that a specific pattern of the patterns formed on the surface of the substrate crosses a scanning direction of the liquid coating nozzle; and

a step of making the liquid coating nozzle linearly scan the substrate relatively, while dispensing a coating liquid from the liquid coating nozzle.

2. The coating film forming method according to claim 1, further comprising a step of arraying a plurality of linear coating liquid lines in a forward-and-backward direction, by repeating an operation in which the liquid coating nozzle is moved in a right-and-left direction to linearly apply the coating liquid on the surface of the substrate, and an operation in which the substrate holding member is moved relative to the liquid coating nozzle in the forward-and-backward direction at a preset pitch.

3. The coating film forming method according to claim 1, further comprising a step of making the liquid coating nozzle linearly scan the substrate relatively from one end of the substrate to the other end thereof, the liquid coating nozzle being provided with a plurality of linearly-arranged dispense ports for dispensing the coating liquid.

4. The coating film forming method according to claim 1, wherein the step of orienting the substrate is performed by rotating the substrate holding member.

5. The coating film forming method according to claim 1,

wherein dicing lines, for dividing the substrate into a plurality of chips each serving as a semiconductor integrated circuit element, are longitudinally and transversely formed on the substrate, and the step of orienting the substrate comprises a step of orienting the substrate such that the scanning direction of the liquid coating nozzle crosses all the dicing lines.

6. The coating film forming method according to claim 1, further comprising a step of returning the substrate to an orientation in which the substrate was oriented when the substrate was delivered to the substrate holding member before starting of a coating process, prior to removing the substrate having been subjected to the coating process from the substrate holding member.

7. The coating film forming method according to claim 1, wherein the step of orienting the substrate comprises a step of retrieving, from data stored in storing means which data is structured so as to associate kinds of substrates with orientations of the substrates, an orientation of the substrate corresponding to a kind of the substrate to be coated, and a step of orienting the substrate in the retrieved orientation.

8. The coating film forming method according to claim 1, further comprising a step of imaging the surface of the substrate; wherein

the step of orienting the substrate comprises a step of determining a direction of the pattern based on an imaging result, and a step of orienting the substrate depending on the determined direction of the pattern.

9. The coating film forming method according to claim 8, wherein the step of orienting of the substrate comprises a step of making the substrate be in the orientation based on a determination result determined based on the imaging result, and based on data structured so as to associate directions of

patterns with orientations of the substrates.

10. A coating film forming apparatus for forming a coating film on a surface of a substrate on which patterns of grooves or ridges are formed, said apparatus comprising:

a substrate holding member adapted to support a substrate horizontally;

a liquid coating nozzle opposed to the substrate held by the substrate holding member, the liquid coating nozzle being adapted to dispense a coating liquid to the substrate;

angle setting means for orienting the substrate in an orientation such that a specific pattern of the patterns formed on a surface of the substrate crosses a scanning direction of the liquid coating nozzle; and

a driving mechanism adapted to cause the liquid coating nozzle to be moved relative to the substrate holding member such that the liquid coating nozzle linearly scans the substrate relatively.

11. The coating film forming apparatus according to claim 10, further comprising a first driving mechanism adapted to cause the substrate holding member to be moved in a forward-and-backward direction relative to the liquid coating nozzle, and a second driving mechanism adapted to move the liquid coating nozzle in a right-and-left direction, whereby a plurality of linear coating liquid lines are arrayed in the forward-and-backward direction to form a film of the coating liquid on the substrate, by repeating an operation in which, after the liquid coating nozzle is moved in the right-and-left direction while liquid coating nozzle dispenses the coating liquid, the substrate holding member is moved in the forward-and-backward direction relative to the liquid coating nozzle at a preset pitch.

12. The coating film forming apparatus according to claim 10, wherein:

the liquid coating nozzle is provided with a plurality of linearly-arranged dispense ports for dispensing the coating liquid; and

the driving mechanism is configured to cause the liquid coating nozzle to be moved relative to the substrate holding member so that the liquid coating nozzle to linearly scan the substrate relatively from one end of the substrate to the other end thereof.

13. The coating film forming apparatus according to claim 10, wherein the substrate holding member is capable of rotating, and the angle setting means is configured to rotate the substrate holding member to orient the substrate in the orientation.

14. The coating film forming apparatus according to claim 10, wherein:

dicing lines, for dividing the substrate into a plurality of chips each serving as a semiconductor integrated circuit element, are longitudinally and transversely formed on the substrate; and

the angle setting means is configured to orient the substrate such that a scanning direction of the liquid coating nozzle crosses all the dicing lines.

15. The coating film forming apparatus according to claim 10, further comprising means for returning the substrate to an orientation in which the substrate was oriented when the substrate was delivered to the substrate holding member before starting of a coating process, prior to removing the substrate having been subjected to the coating process from the substrate holding member.

16. The film forming apparatus according to claim 10, wherein the angle setting means includes means for storing data structured so as to associate kinds of substrates with

orientations of the substrates, and means for retrieving, from the data stored in the storing means, an orientation of the substrate corresponding to a kind of the substrate to be coated, and for orienting the substrate in the retrieved orientation.

17. The film forming apparatus according to claim 10, further comprising image-pickup means for imaging the surface of the substrate,

wherein the angle setting means is configured to determine a direction of a pattern based on an imaging result obtained by the imaging means, and configured to orient the substrate to an orientation depending on the determined direction of the pattern.

18. The film forming apparatus according to claim 17, wherein the angle setting means includes storing means for storing data structured so as to associate directions of patterns with orientations of the substrates, and means for orienting the substrate in an orientation based on a determination result determined based on the imaging result and on the data stored in the storing means.